computing a desired exposure light amount on the substrate, in consideration of the information relating to the variation in intensity of illumination light and the information relating to the distribution of illuminance; and

irradiating the substrate with the illumination light through the pattern on the mask until an exposure light amount on the substrate reaches the desired exposure light amount.

63. (New) The exposure method as claimed in claim 62, wherein the distribution of illuminance in the exposure region is adjusted on the basis of the information relating to the distribution of illuminance in the exposure region so that the distribution of illuminance in the exposure region is maintained at a constant level.

64. (New) The exposure method as claimed in claim 63, wherein the information relating to the variation in intensity of illumination light includes information which varies with the adjustment of the distribution of illuminance.

65. (New) The exposure method as claimed in claim 62, wherein:

the information relating to the variation in intensity of illumination light is a coefficient corresponding to a transmittance variation of the optical system; and

the desired exposure light amount is obtained by multiplying a target accumulated exposure light amount for exposing the substrate by a coefficient corresponding to the transmittance variation.

66. (New) The exposure method as claimed in claims 65, wherein a history of the illumination light passing through the optical system, the coefficient corresponding to the transmittance variation and an amount of adjustment of the distribution of illuminance are saved in association with each other.

67. (New) The exposure method as claimed in claim 66, wherein the history of the illumination light passing through the optical system includes an irradiation time of the illumination light and an irradiation suspension time of the illumination light with respect to the optical system.

68. (New) The exposure method as claimed in claim 66, wherein the history of the illumination light pasing through the optical system, the coefficient corresponding to the transmittance variation and the amount of adjustment of the distribution of illuminance are saved in association with each of a plurality of different conditions for illumination.

69. (New) The exposure method as claimed in claim 62, wherein at least part of the information relating to the variation in intensity of illumination light is modified on the basis of the information relating to the distribution of illuminance.

70. (New) The exposure method as claimed in claim 69, wherein:

the modification is conducted at a predetermined number of times per unit time; and

the predetermined number of times is determined in accordance with a variation per unit time

in the information relating to the variation in intensity of illumination light.

71. (New) The exposure method as claimed in claim 62, wherein the exposure method is a scanning exposure method for irradiating the mask with illumination light in a pulse form while transferring the mask and the substrate in synchronism with each other, and

wherein every time the mask is irradiated with illumination light in a pulse form, an exposure light amount irradiated thus far is accumulated to yield an accumulated exposure light amount; an average value of the accumulated exposure light amount and an average pulse energy are obtained therefrom; and a target accumulated exposure light amount is modified by taking the variation in intensity of illumination light on the exposure region into account, the variation in intensity of illumination light being caused by the variation in transmittance of the optical system, upon conducting the scanning exposure by controlling the exposure light amount so that the accumulated exposure light amount becomes closer to the target accumulated exposure light amount, on the basis of the average value of the accumulated exposure light amount and the average pulse energy.

72. (New) The exposure method as claimed in claim 62, wherein the illumination light for illuminating the mask has a wavelength of 250nm or less.

73. (New) The exposure method as claimed in claim 62, wherein the information relating to the variation in intensity of illumination light is computed on the basis of an amount of light entering the optical system and an amount of light leaving the optical system.

74. (New) The exposure method as claimed in claim 73, wherein the information relating to the variation in intensity of illumination light is saved in association with a history of exposure light passing through the optical system.

75. (New) The exposure method as claimed in claim 62, wherein the optical system is a projection optical system disposed between the mask and the substrate.

76. (New) The exposure method as claimed in claim 62, wherein:

the optical system comprises an illumination optical system disposed between a light source for emitting the illumination light and the mask and a projection optical system disposed between the mask and the substrate;

the information relating to the variation in intensity of illumination light is computed by a first signal output from a first sensor disposed in the illumination optical system so as to detect an amount of the illumination light and a second signal output from a second sensor disposed in an image plane of the projection optical system so as to detect an amount of the illumination light passing through the projection optical system.

77. (New) The exposure method as claimed in claim 68, wherein:

the plurality of different conditions for illumination include a first illumination for illuminating the mask through a first circular opening diaphragm having a first diameter, a zonal illumination, a special oblique illumination and a second illumination for illuminating the mask

through a second circular opening diaphragm having a second diameter smaller than the first diameter; and

either one of the first illumination, the zonal illumination, the special oblique illumination and the second illumination is arbitrarily selected.

78. (New) An exposure method for transferring a pattern formed on a mask onto a substrate through an optical system, comprising the steps of:

obtaining information relating to a variation in intensity of illumination light on an exposure region on the substrate, the variation in intensity of illumination light being caused by a variation in transmittance of the optical system;

measuring a distribution of illuminance on the exposure region through the optical system;

computing a desired exposure light amount on the substrate, in consideration of the information relating to the variation in intensity of illumination light and the information relating to the measured distribution of illuminance; and

irradiating the substrate with the illumination light through the pattern on the mask until an exposure light amount on the substrate reaches the desired exposure light amount.

79. (New) The exposure method as claimed in claim 78, wherein:

the information relating to the variation in intensity of illumination light is a coefficient corresponding to a transmittance variation of the optical system; and

the desired exposure light amount is obtained by multiplying a target accumulated exposure

light amount for exposing the substrate by a coefficient corresponding to the transmittance variation.

80. (New) The exposure method as claimed in claim 79, wherein the coefficient corresponding to the transmittance variation is saved in advance.

81. (New) The exposure method as claimed in claim 80, wherein a history of the illumination light passing through the optical system, the coefficient corresponding to the transmittance variation and an amount of adjustment of the distribution of illuminance are saved in association with each other.

82. (New) The exposure method as claimed in claim 81, wherein the history of the illumination light passing through the optical system includes an irradiation time of the illumination light and an irradiation suspension time of the illumination light with respect to the optical system.

83. (New) The exposure method as claimed in claim 81, wherein the history of the illumination light passing through the optical system, the coefficient corresponding to the transmittance variation and the amount of adjustment of the distribution of illuminance are saved in association with each of a plurality of different conditions for illumination.

84. (New) The exposure method as claimed in claim 83, wherein:

the plurality of different conditions for illumination include a first illumination for

illuminating the mask through a first circular opening diaphragm having a first diameter, a zonal illumination, a special oblique illumination and a second illumination for illuminating the mask through a second circular opening diaphragm having a second diameter smaller than the first diameter; and

either one of the first illumination, the zonal illumination, the special oblique illumination and the second illumination is arbitrarily selected.